IN THE CLAIMS

What is claimed is:

Sub A5

1. A semiconductor apparatus, comprising:

a plurality of device elements formed on a surface of a semiconductor substrate, each device element having a diffusion region; and

a multi-layer wiring configuration electrically connecting at least two of the diffusion regions, the multi-layer wiring configuration containing a plurality of wiring layers, a first wiring layer of the plurality of wiring layers being divided into a first wiring region for providing wiring in a first direction and a second wiring region for providing wiring in a second direction.

2. The semiconductor apparatus according to claim 1, wherein the first direction is orthogonal to the second direction.

Sub A6

3. The semiconductor apparatus according to claim 2, wherein:

predetermined wiring in the first wiring layer is electrically connected to and disposed in parallel with wiring in a second wiring layer of the plurality of wiring layers; and

the second wiring layer has a higher sheet resistance than the first wiring layer.

4. The semiconductor apparatus according to claim 2, wherein the first wiring layer includes:

a first wiring trace in the second wiring region disposed in the second direction;

a second wiring trace in the second wiring region disposed in the second direction and separated from the first wiring trace in the first direction; and

a third wiring trace in the first wiring region disposed in the first direction and electrically connecting the first wiring trace and the second wiring trace.

5. The semiconductor apparatus according to claim 2, further including:

a memory array having bit lines formed with a second wiring layer;

the second wiring layer has a higher sheet resistance than the first wiring layer.

6. The semiconductor apparatus according to claim 5, wherein the memory array has dynamic random access memory cells having a capacitor over bit line structure.

Sub A7

7. A semiconductor apparatus, comprising:

a plurality of functional circuit blocks, each functional circuit block including a plurality of device elements, a first wiring region and a second wiring region; and

a multi-layer wiring configuration containing a plurality of wiring layers for electrically connecting predetermined ones of the device elements,

the multi-layer wiring configuration including a first wiring layer disposed in the first wiring region providing first wiring in a first direction and the first wiring layer disposed in the second wiring region providing second wiring in a second direction.

8. The semiconductor apparatus according to claim 7, wherein the first direction is orthogonal to the second direction.

Sub A8

9. The semiconductor apparatus according to claim 8, comprising:

predetermined first wiring in the first wiring layer is electrically connected to and disposed in parallel with wiring in a second wiring layer of the plurality of wiring layers; and

the second wiring layer has a higher sheet resistance than the first wiring layer.

10. The semiconductor apparatus according to claim 9, wherein the second wiring layer has a higher melting point than the first wiring layer.

11. The semiconductor apparatus of claim 8, wherein the plurality of functional circuit blocks are disposed in a matrix on the surface of a semiconductor substrate.

Sub A9

12. The semiconductor apparatus of claim 8, further including:

a memory array having bit lines formed with a second wiring layer;

the second wiring layer has a higher sheet resistance than the first wiring layer.

13. The semiconductor apparatus of claim 8, wherein the device elements are insulated gate field effect transistors (IGFETs), each IGFET having a source/drain diffusion region and the multi-layer wiring structure electrically connects a source/drain region of at least two IGFETs within a functional circuit block by using the first wiring layer in the first wiring region and the second wiring region.

14. A method for forming a semiconductor apparatus by electrically connecting functional blocks with a multi-layer wiring configuration containing a plurality of wiring layers and each functional block includes a plurality of device elements, comprising the steps of:

forming a diffusion layer associated with device elements on the surface of the substrate;

forming a first interlayer film;

forming a first wiring layer to produce electrodes electrically connected to the diffusion layer;

forming a second insulation film; and

forming a second wiring layer wherein for each functional block a first wiring region provides electrical connections using the second wiring layer in a first direction only and a second wiring region provides electrical connections using the second wiring layer in a second direction only thereby

providing electrical connections between at least two device elements with the second wiring layer through the electrodes produced by the first wiring layer.

15. The method according to claim 14, wherein the first direction is orthogonal to the second direction.

16. The method according to claim 15, wherein the first wiring layer has a higher sheet resistance than the second wiring layer.

17. The method according to claim 15, wherein at least a portion of the wiring formed by the second wiring layer in the first wiring region is disposed in parallel and electrically connected to wiring formed by the first wiring layer producing the electrodes.

18. The method according to claim 15, wherein the plurality of functional blocks are disposed in a matrix on the surface of a semiconductor substrate.

19. The method according to claim 15, wherein the step of forming the first wiring layer also forms bit lines in a semiconductor memory array.

20. The method according to claim 19, wherein memory cells in the semiconductor memory array are DRAM cells having a capacitor over bit line structure and the first wiring layer has a higher melting point than the second wiring layer.